REMARKS

Claims 12, 15-19, 22-26 and 29-30 are pending. Claims 1-11, 13-14, 20-21 and 27-28 stand canceled.

Rejection under 35 U.S.C. § 103(a)

Claims 12, 15-19, 22-26, 29 and 30 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,938,567 (Chartier) in view of U.S. Patent No. 6,491,215 (Irwin, Jr. et al.), hereafter, "Irwin et al." The Examiner states that Chartier lacks disclosure of wherein a first ratio of the first length to the first distance and a second ratio to the second distance are greater than approximately 2 but that it would have been obvious to one of ordinary skill in the art at the time of the invention to pick out the range 2 to 9. Applicants respectfully traverse the rejection.

Applicants first wish to respectfully point out that the formula used in the attachment to the Office Action, R= ρ (L/A), has been incorrectly applied to the invention and therefore, the Examiner's analysis supporting obviousness is moot. In particular, the Examiner appears to have applied the parameter "A" to the area of a main line computed from the length of the line and the thickness of the line. This is incorrect. The parameter "A" used in the formula "R= ρ (L/A)" is the cross sectional area of a conductor (e.g. thickness x width for a rectangular conductor) and not the area as described by the Examiner. Thus, the conclusion that the larger b/a → larger area A → smaller resistance R does not follow from the Examiner's analysis and nor does the Examiner's conclusion that it does not matter about the limit for the ratio of the length of the branch line to the distance between two consecutive branch lines.

Applicants submit that the proper application of the formula R= ρ (L/A) to the structure of the present invention yields the following equation:

$$R = \rho \frac{L}{A} \left(\frac{1 + \dfrac{b}{2a}}{1 + \dfrac{b}{a}} \right)$$, which gives rise to the values given in Table 2 of the application.

Applicants submit that the proper analysis of the structure leads to a structure which is non-obvious.

To establish *prima facie* obviousness of a claimed invention, <u>all the claimed limitations must be taught or suggested</u> by the prior art. <u>*In re Royka*</u>, 490 F.2d 981, 180 USPQ 580 (CCPA 1974), MPEP §2143.03.

Applicant submits that neither Chartier and Irwin et al. teach, suggest or disclose a wire structure with branch lines having a first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2, as recited in independent claims 12, 19 and 26.

Chartier is directed to a method of replicating traces in a multi-layered electro-optical display panel for the purpose of redundancy. As admitted by the Examiner, Chartier does not disclose, teach or suggest branch lines having a first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2.

Irwin et al. teaches only that the resistance of a printed resistor track is a function of the various geometrical and material parameters of the printed resistor track (e.g. bulk resistivity of the ink, length of the track, thickness of the track and the width of the track). Nowhere does Irwin disclose, teach or suggest a wire structure having a main line and a plurality of branch lines on separate layers, much less the specific teaching of branch lines having first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2.

Applicants have determined, by performing an analysis of the geometry of the wire structure (see for example pages 6 and 7 of the application), that a range of b/a between 2 and 9 is preferred for the structure of the branch lines of the claimed multi-layer wire structure. Irwin et al., on the other hand, teaches only what is well known about the resistance of a conductor and does not relate those teachings to the structure of the claimed invention. One of ordinary skill in the art reading Irwin et al. seeking to lower the resistance of a wire would be led to modify the bulk resistivity of the ink, length of the track, thickness of the track or the width of the wire and certainly would <u>not</u> be led to a conclusion that a preferred construction of a wire structure would utilize branch lines having a first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2.

Because neither Chartier or Irwin et al. disclose, teach or suggest branch lines having a first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2, the combination can not possibly teach or suggest a first ratio of the first length to the first distance and a second ratio to the second distance greater than approximately 2,

as recited in claims 12, 19 and 26. Accordingly, Applicants respectfully request reconsideration and withdrawal of the §103 rejection of independent claims 12, 19 and 26.

The dependent claims are believed to be allowable because they depend upon the respective allowable independent claims, and because they recite additional patentable steps and elements.

Conclusion

Insofar as the Examiner's rejections were fully addressed, the instant application is in condition for allowance. A Notice of Allowability of all pending claims is therefore earnestly solicited.

Respectfully submitted,

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February 13, 2007
(Date)

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